

Observations of ground activity in Leadbeater's possum *Gymnobelideus leadbeateri* in subalpine snowgum woodland at Mount Baw Baw, Victoria

Leadbeater's possum *Gymnobelideus leadbeateri* is an iconic Australian species and the faunal emblem of Victoria. The species is declining, however, (Hansen *et al.* 2009) due primarily to habitat loss as a result of logging (Lindenmayer *et al.* 1993). *Gymnobelideus leadbeateri* is listed as 'Threatened' under the Victorian *Flora and Flora and Guarantee Act 1988* and 'Endangered' under the Commonwealth *Environment and Biodiversity Protection Act 1999*.

Gymnobelideus leadbeateri is a nocturnal species that emerges from dens in tree hollows at dusk (Lindenmayer *et al.* 1991; Lindenmayer and Meggs 1996). Plant exudates (e.g. *Acacia* sap), insect exudates (e.g. psyllid honeydew) and arthropods are its primary food sources (Smith 1984). As a result *G. leadbeateri* is an arboreal species that rarely forages or moves along the ground (Harley 2006). *Gymnobelideus leadbeateri* typically is found in montane wet forest with mountain ash *Eucalyptus regnans* as the canopy species at elevations between 400 and 1200 m (Lindenmayer *et al.* 1989), although a small population inhabits low-lying swamp gum woodland near Yellingbo (Smales 1994). The species also has been recorded in subalpine snowgum *E. pauciflora* woodland at Lake Mountain (Jelinek *et al.* 1995).

Observations

On 11 December 2012, two individual *G. leadbeateri* were trapped in ground-set Elliott live traps in the Mount Baw Baw resort (37°50'S, 146°16'E). Traps were baited with standard small mammal bait (mixture of oats, peanut butter, honey, vanilla essence and linseed oil). Trapped *G. leadbeateri* consumed this bait. A small piece of ear tissue was sampled from each animal (following a request from Zoos Victoria). Individuals were kept in cloth bags in a quiet location indoors during the day and released at dusk at their respective points of capture.

An additional four individuals were trapped during subsequent trapping sessions (4 trap

nights per session) in December 2012 and January 2013, from different locations within the resort. Recaptures could be identified by the small hole left in the ear from tissue sampling. Individual animals could be identified due to differences in weight, behaviour and trap location. Some individuals were trapped up to six times, with a mean recapture rate of 3.2 times. Five adults and one juvenile were trapped. One female (143 g) had a pouch young. The average weight of five adult individuals was 118 grams, with the juvenile weighing 75 g.

The six individuals trapped were from three locations (nearest neighbour distance of 100–360 m) in snow gum woodland within the resort. All locations were connected to neighbouring montane forest via tree canopies. On release, some individuals moved immediately into the snowgum canopy. However, others entered a hollow under a fallen log at the base of a snowgum.

Trapping was conducted with approval by the Deakin University Animal Ethics Committee (G16-2012) and under permit by the Department of Environment and Primary Industries (permit number 10006414).

Discussion

These observations are unusual in that *G. leadbeateri* rarely has been trapped in ground-set traps and observed on the ground. Previous studies suggest that *G. leadbeateri* do not need to come to the ground because all of their resource needs are met in the mid- or upper-storey of forests (Smith 1984, Lindenmayer and Meggs 1996, Harley 2006). Despite this, we repeatedly trapped individuals in ground-set traps, suggesting that ground visits may not be uncommon, at least in this habitat type. Furthermore, after release some individuals remained on the ground, moving amongst fallen branches and leaf litter. None of these individuals appeared to be suffering any ill-effects of trapping that might have resulted in unusual behaviour. The woodlands where individuals

were trapped had contiguous canopies permitting unrestricted arboreal movement of *G. leadbeateri* over large areas. Although diet has been studied at lower elevation, little is known about diet in subalpine habitats. In subalpine snowgum woodland where there is no flowering mid-storey and potentially a shortage of food resources in the canopies, *G. leadbeateri* may need to forage on the ground.

Our observations also suggest that in snowgum woodlands, *G. leadbeateri* may use dens at ground level. After release, some individuals disappeared into an opening in the vegetation near the base of a snowgum and did not reappear. This opening was under a fallen log and surrounded by leaf litter, rocks and vegetation to a height of 60 cm. It led into a network of tunnels, suggesting that it may be the entrance to a den in the base of a snowgum. On further inspection, none of the snowgum in the area had hollows except at their bases. These have formed where snowgum trunks that were burnt by a 1939 fire have rotted and been encompassed by regrowth. The absence of tree hollows in the area, coupled with the fact that individuals were regularly trapped on the ground in the same location suggests that this was a denning site.

In a study at Lake Mountain, *G. leadbeateri* also were observed foraging near the ground at the base of snowgums (Steve Smith pers. comm.). In addition, some den entrances were found at ground level amongst rocks and tree roots, although the dens themselves were inside the trunk approximately 1 m above ground (Steve Smith pers. comm.). This suggests that in subalpine environments *G. leadbeateri* may come to the ground more often than previously thought.

Consequences

This location record for *G. leadbeateri* is not unusual. *Gymnobelideus leadbeateri* have been recorded in the nearby montane wet forest and also observed denning in the roof of a lodge within the alpine resort village (resort staff pers. comm.). Trapping locations were in subalpine snowgum woodland with a contiguous canopy and within 1 km of montane wet forest. This confirms that the species can exist and even breed in snowgum woodland although further

research is needed to determine the conservation importance of this habitat type to the species. Factors such as distance to and connectivity with montane wet forest, and availability of denning locations and food resources may affect both occupancy and population success of *G. leadbeateri* within subalpine woodland.

Research on the ecology of the species in subalpine woodland is also needed. Our observations suggest that *G. leadbeateri* can modify their behaviour in response to resource availability. However, use of the ground stratum increases their risk of predation by invasive animals such as foxes and cats, which occur throughout the area.

References

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